April 21, 2008
Monday

“Which Path to Metallic Hydrogen: High or Low Temperature”

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4:15 P.M. in Jefferson 250

Tea will be served at 3:30 P.M. in Jefferson 450

http://www.physics.harvard.edu

Over 70 years ago Wigner and Huntington predicted that solid molecular hydrogen would transform to a high density atomic metallic lattice at a pressure of 250 kbars. Ashcroft predicted that metallic hydrogen may be a room temperature superconductor. Although metallic hydrogen is believed to occur in the cores of the outer planets of our solar system, it has not been produced on earth. Several phase transitions at high pressure have been observed in hydrogen and its isotopes at low temperature, but none to the metallic state. Recent theory predicts an unusual melting line for hydrogen with a peak at high temperature and pressure, extrapolating to a liquid at T=0 K and multi-megabar pressures. We have observed the peak in the melting line and shall discuss this, the unusual properties of this simplest of all atoms, and the various phases.